

# COLLEGE EYE EXTRACT FROM THE CHECO REPORT

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**PROJECT**

Commodity  
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Evaluation of  
Commodity  
Operations  
**REPORT**

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**COLLEGE EYE**

**1 NOVEMBER 1966**

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**HQ PACAF** MICROFILMED BY ISAM

**Directorate, Tactical Evaluation  
CHECO Division**

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**Prepared by:**  
**CAPTAIN CARL W. RENDEL**

**Project CHECO**  
**7th AF, DOAC**

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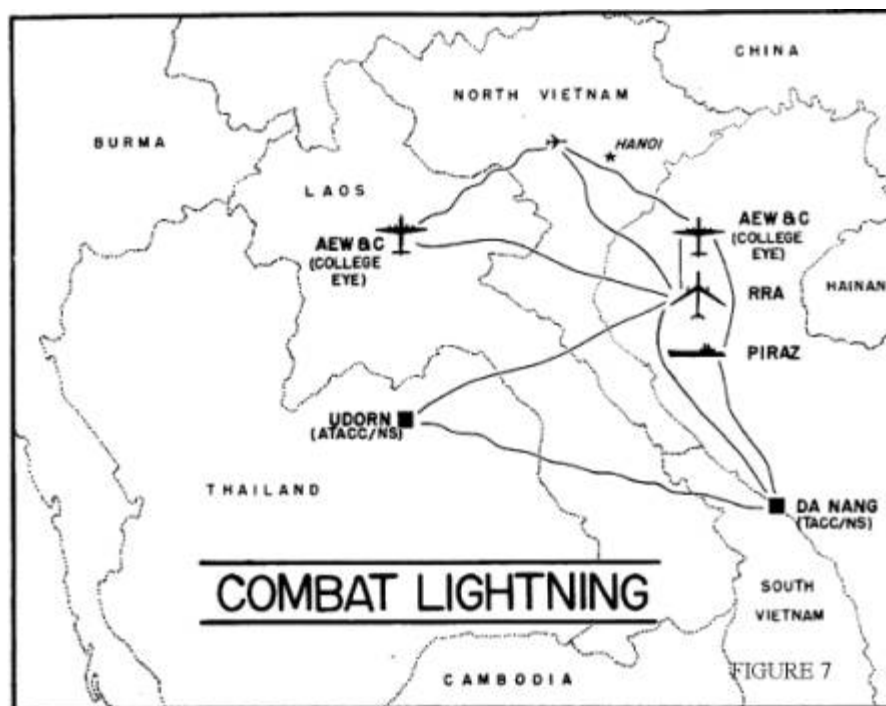
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## COMBAT LIGHTNING

In the summer of 1966, the Air Force Chief of Staff directed that dynamic and aggressive action be taken to provide the required monitoring and control of USAF forces operating over North Vietnam. From the point of initial planning in compliance with this directive, task force capabilities were an important consideration. In fact, the SEAOR-62 improvements discussed in Chapter II were justified, in part, by Seventh Air Force in terms of their contribution to the plan for providing increased monitoring and control.

The plan, Project COMBAT LIGHTNING (Appendix III and Fig. 7), was originally developed to establish a command and control facility, which was identified as the Tactical Air Control Center, North Sector (TACC/NS). Located at Monkey Mountain, near Da Nang AB, as stated previously, the call sign of the TACC/NS was MOTEL. With implementation of this plan on 1 November 1966, the task force's responsibility was to provide data to the TACC/NS communication and display system. 10/



In a briefing given on 13 December 1966, Brig. Gen. Joseph J. Kruzel, II PACAF, DCS/Operations, described COMBAT LIGHTNING as a plan “...for the tactical control and airspace management system designed to correlate, direct and monitor tactical air operations involving North Vietnam.” 11/

This encompassed the issuing of border warnings, SAM and MIG warnings, advising aircraft of current enemy defenses and coordinating overall air operations in North Vietnam. The proposed system included automated data processing and display equipments obtained from the ADC BUICK program, located at Monkey Mountain and Udorn RTAFB. At that time, it was envisioned that the task force aircraft would provide radar inputs to the sites at Udorn and Monkey Mountain from three stations: One over Laos, a high station, and a low one over the Gulf of Tonkin. (Fig. 8.) Radio Relay aircraft were to be used as a relay platform to allow ground facilities to communicate directly with tactical aircraft over North Vietnam. There were also to be inputs from other sources, such as from the Navy Positive Identification Radar Advisory Zone (PIRAZ), ship in the Gulf of Tonkin.\_12/

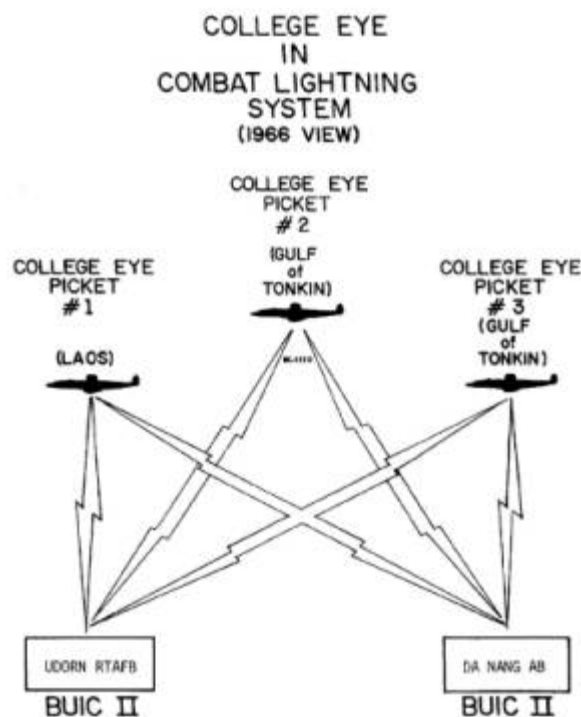


FIGURE 8

As the task force developed greater equipment capabilities, particularly with the installation of the QRC-248 and the AN/GPA-122 (described in Chapter II), there were increasing problems in the interfacing of the new equipment with the various subsystems. Nevertheless, in a letter written to the Secretary of the Air Force on 1 May 1968, the Seventh Air Force Commander, Gen. William W. Momyer, expressed his optimism concerning the completion of the overall system:”\_13/

“...*Project COMBAT LIGHTNING is designed to interface a number of automated subsystems to give me a near real-time command and control capability... The complete system is programmed to be fully operational in approximately one year.*”

There were important changes and additions (Appendix III) in the proposed overall system after 1 November 1966.

Apart from the inputs and relationships excluded from Figure 7, such as IRON HORSE, YOGI BEAR, and the automated transmission of data to Tan Son Nhut AB (Fig. 9), the position of COLLEGE EYE in the proposed automated system as a source of input data for the TACC/NS stations remained as illustrated throughout the period of the report.

## CHAPTER IV

### OPERATIONAL ACTIVITY

#### ROLLING THUNDER

In March 1965, a regular program of strikes was begun against North Vietnam. Apart from the limitations on bombing during 13-18 May 1965, the bombing pause of 24 December 1965 - 30 January 1966, and the bombing restrictions which began on 31 March 1968, this program of strikes has continued under the name ROLLING THUNDER. \_1/

After its arrival in Southeast Asia, the task force regularly flew missions in support of this program of strikes against North Vietnam. Appendix IV shows the number of combat missions flown by the task force. Most of these combat missions, except for those periods when there was a stand down of air operations against North Vietnam, were flown in direct support of ROLLING THUNDER.

With restrictions on bombing in effect after 31 March 1968, an important activity of the task force was the support of tactical air operations in the BARREL ROLL area (Fig. 10) of Laos. Meanwhile the task force maintained its capability to resume full support of the ROLLING THUNDER program.

The activities of the task force in support of ROLLING THUNDER, and the development of its associated mission responsibilities, were closely related to the three major orbits, or stations, flown at different times during the unit's history. With Ethan as the task force call sign, these stations were manned by flights usually referred to as Ethan Alpha, Ethan Bravo, and Ethan Charlie. The story of these stations (Alpha, Bravo, and Charlie) in terms of flying time history, is shown in Appendix IV. In the spring of 1968, 7AF requested that the stations be redesignated for compatibility with other units in the theater. The gulf mission became "O1", the Laos missions "02" and "03", with special gulf missions redesignated "04". The names Alpha, Bravo, and Charlie are used in this report because for most of the period covered by the report, they were the names used. The Ethan Charlie orbit was flown over Laos on a daily basis after 13 October 1966, \_2/ whereas either the Ethan Alpha, or the Ethan Bravo flight was flown over the Gulf of Tonkin ever since the task force's deployment to Southeast Asia in April 1965.

The flights over the Gulf of Tonkin have been flown on an alternate basis with the RIVET TOP aircraft since 31 March 1968. RIVET TOP is the designation for a single prototype EC-121K with special purpose electronic equipment aboard, giving it an effective anti-MIG and anti-SAM capability. Used to start a test program at Udorn RTAFB on 9 August 1967, it was originally scheduled to continue for 179 days. \_3/ Retention of the aircraft was due, in part, "...to delays in obtaining comparable Security Service positions and secure air-to-air communications aboard COLLEGE EYE." \_4/ However, as of 30 June 1968 it was still in the theater flying missions from Korat RTAFB. Organizationally, RIVET TOP was Detachment 2 of the Tactical Air Warfare Center and was located at Korat after 17 October 1967.

The airplane flown on all of these missions was the EC-121D, a modified version of the venerable old Lockheed Super Constellation. The aircraft was easily recognized because of its bulging dorsal and ventral radar domes, which contained antennas for the AN/APS-95 Search Radar and the AN/APS-45 Height Finder. The airframe proved itself reliable during many thousands of hours of operation.

## EC-121D - TYPICAL ANTENNA LOCATION DIAGRAM

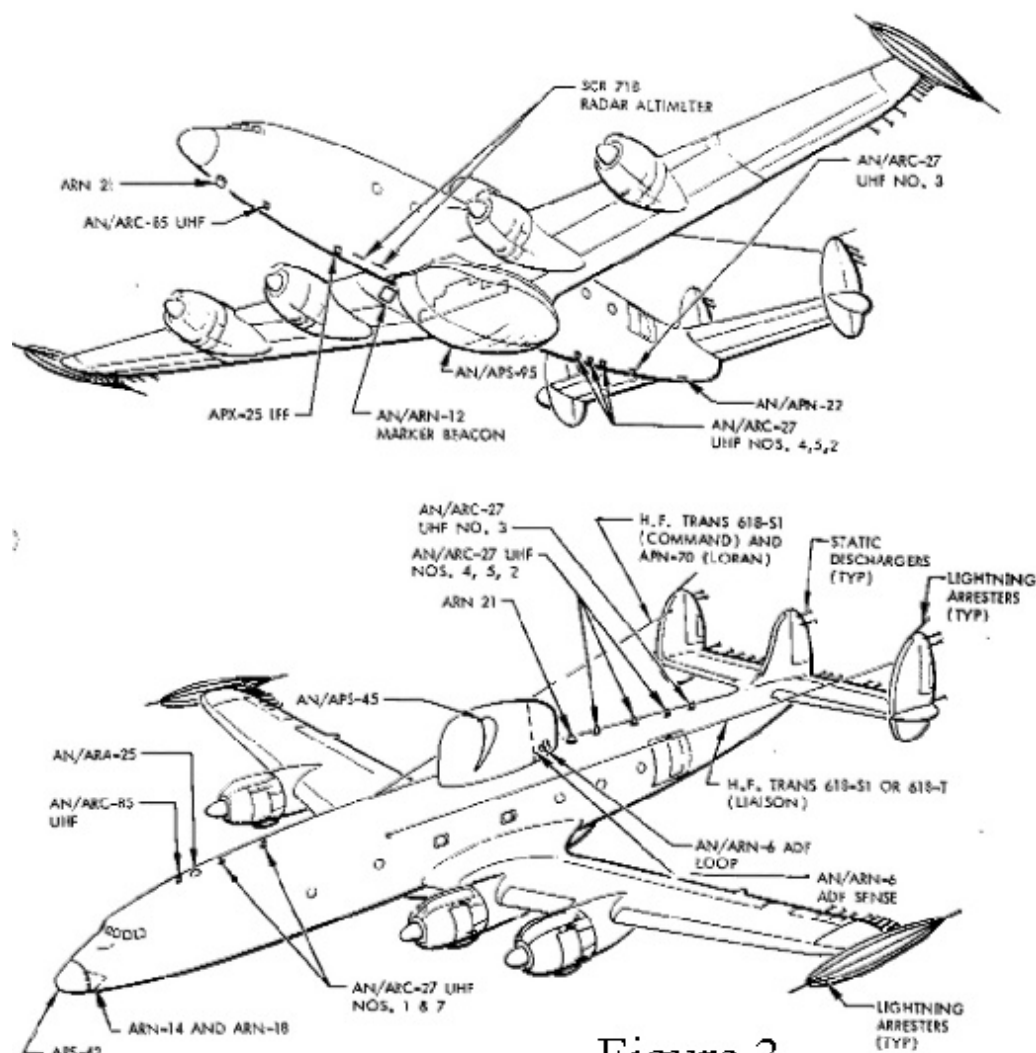


Figure 3

A normal crew on the aircraft, from the very beginning of the task force's deployment to Southeast Asia, consisted of 18 men, 6 officers, and 12 enlisted men. The flight crew consisted of the aircraft commander and copilot, two navigators, two flight engineers, and a radio operator. The radar crew included two weapons controllers (one senior director in charge of the radar compartment and one duty weapons controller), both officers. In addition, on the radar crew there was one crew chief, an assistant crew chief, four search radar operators, one intercept control technician, and two radar technicians, all enlisted personnel. The only important change in the composition of the crews took place on those missions which were flown with a RIVET GYM configuration after 10 May 1968. The RIVET GYM crews consisted of four operators, a supervisor, and a maintenance technician all from the USAF Security Service.\_5/

The crews were TDY to Southeast Asia for a period of approximately four and one-half months. During that time, they often accumulated 500 hours of combat flying time, usually on missions providing routine station coverage. The scope of the task force effort, however, included assistance in search and rescue operations, and the radar control of the rendezvous of fighters and tanker aircraft for emergency and scheduled refueling. The range of COLLEGE EYE activities in the employment of their capabilities is indirectly shown in Figure 13.

## Gulf of Tonkin

The task force regularly flew the Alpha station over the Gulf of Tonkin from 16 April 1965 until 4 December 1967. In general terms, this station was a 50-mile racetrack pattern over the Gulf of Tonkin, about 30 miles from the coast of North Vietnam. Although the exact position of the orbit changed slightly from time to time, the general location of the Alpha station and other stations flown by the task force, is shown in Figure 1.\_6/

Flown on a daily basis, this orbit was extremely demanding for both men and equipment. To get maximum performance from the search radar, the orbits were flown at altitudes ranging from 50 to 300 feet above the water (the radar system's optimum effectiveness was achieved when its beam was reflected from and supported by the water's surface at a very low altitude). These low altitudes were often flown in conditions of poor visibility, particularly during the monsoon season with its accompanying rain squalls. For the radar crew, the temperatures were particularly high because of the boost given to the already high temperatures by the operating electronic equipment. The air conditioning system was not designed for effectiveness at this low altitude and was of little assistance. Because of these conditions, flight surgeons were often carried on the Ethan Alpha orbit. \_7/

Initially, the concept of operation for the orbit was the manning of a primary station, plus an airborne spare. The airborne spare provided a rear cover for the primary station and maintained a current picture of the operational situation, always prepared to assume the primary station if necessary. The orbits were not flown directly over one another because the radiation patterns of the radio antennas prevented effective communication between the aircraft when they were in this position. When necessary the aircraft would recycle at Da Nang AB for refueling, a continuing practice for flights over the gulf.\_8/ This consistent radar coverage made it possible for task force aircraft to issue the MIG alerts, along with position, range and bearing which set up the first USAF MIG kills in Southeast Asia on 10 July 1965,\_9/ The mission report for 10 July 1965, citing "highly successful results, stated:10/

*"...two non-squawking unknowns were detected and tracked in the Hanoi area., Based on these detections, two MIG warnings were issued to Strike and CAP aircraft. Mink Flight, F-4Cs performing MIG CAP, reported receipt of these BIG EYE MIG warnings. This flight subsequently destroyed two MIG-17s."*

Changes in the location of stations flown by the EC-121Ds over the Gulf of Tonkin, the height of the orbits, and other related adjustments, were attempts by the task force to better fulfill the operational requirements ( ) Hq, 2d Air Division, and more specifically, usually of the ROLLING THUNDER program. An example of how these changes were effected during the task force deployment to Southeast Asia followed the change in the ROLLING THUNDER Route Package segment system (Fig. 10)

# OUT-COUNTRY OPERATIONS

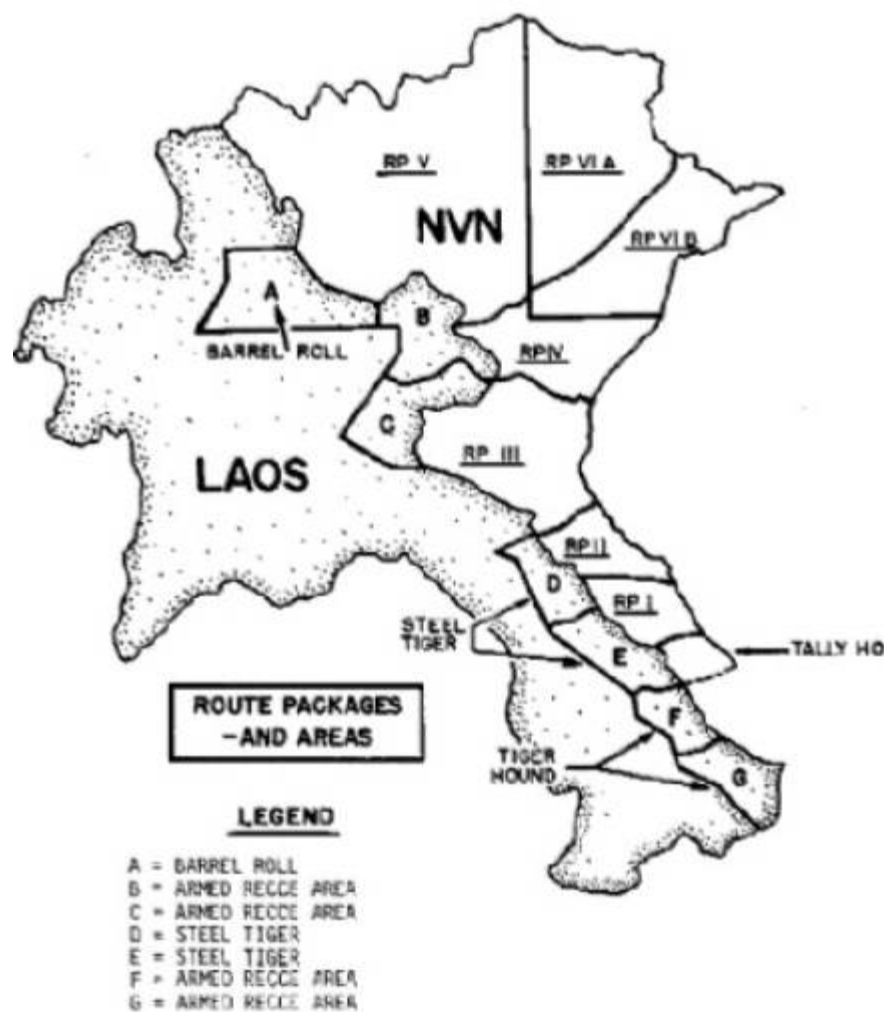


FIGURE 10

on 1 April 1966. As a result of the changes, target planning in Route Packages II, III, and IV was the responsibility of the Navy, and Route Packages I and V, the responsibility of the Air Force. Route Package VI, the Hanoi and Haiphong complex, was divided into segments VIA and VIB, with the Air Force assigned mission and target planning in VIA, and the Navy in VIB.<sup>11/</sup>

It soon became clear to the task force staff that a reevaluation of its concept of operations was necessary to maintain mission effectiveness. With no MIG activity in Route Package I, and with the Navy responsible for Route Packages II, III, and IV, the Alpha station flown at that time limited the effectiveness of task force aircraft. After flying several test missions and gathering data to support a move to fly a new station further north, the task force commander, Lt. Col. James Q. McCall, and two staff members briefed Maj. Gen. G. L. Meyers, Vice Commander of 7AF, and Brig. Gen. George B. Simler, Deputy Chief of Staff/Operations, 7AF, on 9 and 10 May 1966.<sup>12/</sup>

General Meyers decided to move the Alpha station farther north and, on 12 May 1966, task force aircraft began flying a track which had a station center of 20 degrees North and 107 degrees East. Previously, the station center was

approximately 19 degrees, 25 minutes North and 107 degrees, 25 minutes East. As a result of the move north, and a slight increase in altitude, task force aircraft now had the ability to look at low altitude targets in the Red River Delta area of North Vietnam. They could also provide range and bearing information on unknown tracks to the defensive MIG CAPs orbiting during the strike periods of ROLLING THUNDER, and although special emphasis was being placed on Route Package VI, the task force still retained the responsibility of covering Hainan Island and the area south toward Route Package I. 13/

The airborne spare, described earlier in this chapter, was named the Ethan Bravo flight. As indicated, it was originally flown as a low-level orbit for service as an immediate back-up capability for the Ethan Alpha flight. With the development of the border warning mission in late 1966, the Ethan Bravo flight was suspended in favor of the Ethan Charlie station over Laos. Emphasis placed on the border warning responsibility, and coverage of the entire Chinese Communist and North Vietnamese Borders provided by combined manning of the Alpha and Charlie stations, made it necessary to suspend the Ethan Bravo flight, until augmentation of the task force permitted it to assume a three-station posture. 14/

During April 1967, the task force was augmented to facilitate the three track concept. Four additional aircraft, aircrews, and 32 maintenance personnel were sent to Tainan AB, until their in-country clearances for Thailand were received. Two of the aircraft and three additional aircrews arrived at Ubon RTAFB on 29 May 1967. This raised the task force strength at the forward operating base to six aircraft and seven crews, a level which was subsequently maintained until 1 July 1968. 15/

After this augmentation, a different mission was developed for the Ethan Bravo flight. This orbit served as the primary station for the QRC-248 and was strategically located to provide the most effective mission results and comprehensive border coverage. The flying of this station also enabled the Ethan Alpha flight to concentrate more fully on the Gulf of Tonkin track and on MIG warnings. Before using the QRC-248, the Ethan Alpha flight over the Gulf of Tonkin normally provided more useful information than either the Ethan Bravo flight over the gulf, or the Ethan Charlie flight over Laos.

With the incorporation of the QRC-248 into COLLEGE EYE operations, Ethan Bravo and Ethan Charlie flights provided significantly more useful information than the Ethan Alpha flight, especially during the Alpha strikes of ROLLING THUNDER operations. 16/

An example of success with the radar capability took place on 24 October 1967, however, when an 8th Tactical Fighter Wing F-4 Phantom crew scored a MIG kill over the Gulf of Tonkin, using information provided by a COLLEGE EYE Senior Weapons Controller, Capt. Joseph E. McGrath. "The strike force was coming up overland," said McGrath. He continued, "On our radar we spotted a 'bandit' coming west from Hanoi. The enemy fighter was streaking toward the strike force, so we called vectors on the MIG to the two flights who were flying MIG CAP." Maj. William L. Kirk, the F-4 aircraft commander, received the warning and started a series of offensive maneuvers resulting in the MIG kill. He praised the COLLEGE EYE crew and gave them full credit for initially identifying the enemy, saying that aerial directions were "...right in the bull's eye". 17/

After 1 December 1967, the Bravo station was flown at 11,000 feet, with the aircraft on station one hour before



the A.M. and P.M. Alpha strikes, and a refueling cycle at Da Nang AB between the two station times. The station center was at 20 degrees North and 107 degrees East as of 6 December 1967. This orbit was to be maintained except when Seventh Air Force would direct the Ethan Bravo flight to descend and to assume the lower altitude Alpha orbit.\_18/

The Alpha station was flown until 4 December 1967, when the increased equipment capability on the part of the task force made it a relatively unprofitable use of resources. As noted previously, this was primarily due to the severe overland limitations of the radar aboard the EC-121D, and to the greatly increased capability afforded by the QRC-248, which had been in operational use by the task force since 21 July 1967. The overland targets that were detected on radar had been non-squawking aircraft in the altitude range of 10,000 feet or above. \_19/ Subsequently, the task force "...recommended to 7th Air Force, and received approval to discontinue the low altitude radar platform in favor of two, and later three, sorties, making almost exclusive use of the Enemy IFF (the QRC-248)..."\_20/ When the Alpha station was eliminated, the Bravo station (at a higher altitude) was moved in closer to the orbit previously flown by the Ethan Alpha flight. This provided better MIG warning, flight following, and border warning coverage.\_21/

## **Laos**

An orbit over Laos was flown on a daily basis after 13 October 1966. The general locations of the orbits flown since that time are shown in Fig. 1. Although the initial motivation for the flying of-the-orbit was the prison of border warning information to friendly aircraft in danger of straying over the Chinese Communist Border, the orbit also became useful in various other roles. This was particularly true after the bombing restrictions of 31 March 1968, and the subsequent support by the task force of operations the BARREL ROLL area of Laos.

The history of the orbit began in early 1966. On 21 May 1966, following the statement by Communist China that a U.S. Air Force aircraft shot down a MIG-17 over the Chinese mainland on 12 May 1966, the Owens Inquiry Board convened at Tan Son Nhut AB to investigate the Chinese claim. The board was composed of officials from the Department of Defense, and the task force represented at the meetings by Lt. Colonel Mulherron (Radar Officer) and Major Figeroid (Operations Officer) 22/

At the time of the alleged incident, the task force was not on station because of an aircraft abort by the Ethan Bravo flight. However, extracts from the logs of Ethan Alpha and Ethan Bravo flights were made an official part of the proceedings. As part of the investigation, special missions were flown by Seventh Air Force to recreate the exact flight path of the Electronic Countermeasures (ELM) aircraft and the fighter escort involved in the incident. The task force flew special missions to flight-follow these aircraft, and to insure that there would be no border violations. Pictures taken by the task force aircraft were used in completing overlays of the entire flight route for the Owens Inquiry Board.\_23/

Seventh Air Force informed the task force on 18 June 1966 that the Owens Inquiry Board recommended that it fly missions over Laos in addition to operating over the Gulf of Tonkin. The purpose of the proposed Laos missions was to extend the coverage of ground radar sites, and to prevent border violations by ROLLING THUNDER strike forces and Silver Dawn aircraft. The first test of the new station was flown on 24 June 1966. The new station, the Charlie station, had coordinates of 19 degrees 20 minutes North and 102 degrees 20 minutes East. On this test, the EC-

121Ds were required to recycle twice out of Da Nang AB for refueling and flew six hours on station at altitudes of 12,000 to 14,000 feet. \_24/

The feasibility of flying the Ethan Charlie track was discussed again by Seventh Air Force and the task force in mid-July 1966. In view of the results of the 24 June 1966 test mission, it was agreed that BIG EYE had the capability of maintaining surveillance over the Chinese Communist Border, and of issuing warnings to friendly aircraft when they approached the buffer zone. \_25/

A new aspect of the proposed task force mission over Laos was raised when Col. A. M. Hendry, Seventh Air Force Director of Combat Operations, requested that additional test missions be flown over Laos to test the capability to control post-strike tanker hookup, and to aid in the rescue of downed aircrews. These were problem areas in that they were normally out GCI and UHF range. The BIG EYE Commander, Lt. Col. Waldo W. Peck, complied with the understanding that the mission would be an IFF/SIF beacon mission because of the overland limitations of the radar. In addition, it was agreed that a Seventh Air Force Airborne Battlefield Command and Control Center (ABCCC) controller would fly in a test capacity with the crew on the Laos orbit.\_26/

On 23 July 1966, about a month after the test flight which followed the initial recommendation of the Owens Inquiry Board, a second test series under the expanded mission concept was flown over Laos. The coordinates were changed slightly with the new coordinates being 20 degrees North and 103 degrees East. The aircraft were scheduled to be on station for approximately four hours, recycling once each mission through Udorn RTAFB for refueling, a frequent practice on subsequent Ethan Charlie flights. The missions were flown at altitudes between ten and eighteen thousand feet and stabilization was maintained by use of Tactical Air Control and Navigation (TACAN).-27/

The Laos mission tests were concluded on 8 August 1966 and a report on the results was completed by Lt. Col. P. N. Howard, Chief of ABCCC Team Nr. 3, Seventh Air Force. From the task force's point of view, the summarized results of the five test missions were excellent: (1) strike flights were monitored and plotted on the control board from pre-strike refueling, to the target area, and through post-strike refueling; (2) a total of seven strike flights--28 aircraft--were flight-followed at one time; (3) the Chinese Communist Border and buffer zone were under continuous observation at all times; (4) the controllers maintained good surveillance of RESCAP flight proceedings and relayed Mayday messages to the Seventh Air Force Command Post. \_28/

As a result of the success of the five test missions on the Laos orbit, 7AF recommended that the Ethan Charlie station be flown on a permanent basis. The Laos mission was flown beginning on 24 August 1966, but limited task force resources restricted the flights on the Ethan Charlie station to every third day. On this day, the Ethan Alpha flight would fly alone over the Gulf of Tonkin, recycling through Da Nang AB for refueling to give the required coverage. Both the Ethan Alpha and the Ethan Bravo flights were scheduled to fly over the gulf on days that the Ethan Charlie flight was not scheduled to fly.\_29/

It was clear that the resources of the task force did not permit full operational implementation of the orbit over Laos. Because of the favorable test results, consideration was given to meeting the requirements of flying the orbit on a daily basis. A message sent by the Air Force Chief of Staff on 7 October 1966 to ADC stated, "...PACAF has directed Seventh Air Force to establish concept of operations and FOB location to support this Laos orbit. The BIG EYE Laos

orbit, when operationally implemented, would require an increase from current seven to eleven aircraft and aircrews.” This augmentation took place in April-May 1967. Until that time, the static requirements over Laos were facilitated by stopping the Ethan Bravo flight over the Gulf of Tonkin.\_30/

The overall concept under which there would be simultaneous manning of the Alpha, Bravo, and Charlie stations during ROLLING THUNDER strike period was confirmed by Seventh Air Force on 25 October 1967. Although this was concept envisioning a maximum of approximately 1,410 hours a month, the task force in practice flew considerably fewer hours. Under the concept, the Ethan Alpha flight would fly the low altitude Gulf of Tonkin orbit for dawn to dusk station coverage. The Ethan Bravo flight would fly-a medium altitude orbit above Ethan Alpha to supplement the radar watch and to extend SIF bo' warning capability to Route Package VIA and VIB. Over Laos, the Ethan Charlie aircraft would provide SIF border warning capability in Route Pack V and VIA.\_31/

Following the bombing restrictions on 31 March 1968, the intensity of activity for the task force while on station changed considerably, particularly for the Bravo station, with fewer strikes north. Although this was also true for the Charlie station over Laos, there was new activity developing in Laos for the task force: Beginning on 19 April 1968, at the direction of Seventh Air Force, COLLEGE EYE began providing positive control for C-130 flare flights and A-26 strikes in conjunction with ground controllers in the BARREL ROLL area of Laos. 32/

The important control responsibilities to be exercised by the task force were spelled out in a message from CINCPAC to the JCS on 21 April 1968. The control measures, to prevent the bombing of restricted areas of North Vietnam and Laos, and to control strikes in the BARREL ROLL area of Laos (Alpha, Bravo, and Coco sectors), included: \_33/

*“...A. COLLEGE EYE aircraft will maintain a NW to SE orbit with a stabilization point at 20N/104E to provide positive control of strike aircraft operating in the Alpha, Bravo, and Coco sectors. B. Aircraft entering BARREL ROLL area must have operational IFF/ SIF displayed. C. COLLEGE EYE will provide border warning to any aircraft entering an area within 15 km of the NVN border and best egress heading away from border. D. All strikes conducted within 10nm of the NVN border north of 19 degrees will be under positive COLLEGE EYE and Fac control....”*

Although this function was performed without any extraordinary incidents or problems, there was an occasional variation in routine station coverage. For example, on 10 May 1968, the task force was directed to extend its normal 19-hour coverage on the Charlie station to 24 hours, a 67-hour commitment from 0600 on 10 May until 0100 on 13 May. This effort was in support of continual strike activity by A-26, A-1E, and F-105 aircraft around Lima Site 36 in Laos, which was being attacked by hostile forces. 34/

As of 30 June 1968, the task force was manning the Laotian station and the station over the Gulf of Tonkin. The period of coverage for the Charlie station changed from time to time, but basically it remained two aircraft flying maximum endurance missions on a back-to-back basis. The gulf station was flown on an every-other-day basis with the prototype aircraft RIVET TOP flying on the alternate days, with the task force assuming responsibility for station coverage whenever the prototype aborted. 35/

Apart from the expanded responsibilities of the task force on the Laotian station, the spring of 1968 was of interest in the task force's history because of efforts to assay the usefulness of the task force's capabilities in another potentially

critical area, Korea, The history of these efforts is surveyed in the following paragraphs:

### Korea

Early in 1968, consideration was given to the employment of COLLEGE EYE aircraft as an augmentation force to increase command and control capabilities in Korea. Queries and thinking on the subject dated from- at least January 1968. 36/ The capture of the Pueblo, and increased guerrilla activity in South Korea, generated greater commitments of forces and material by the United States to South Korea. As a result of the threat from North Korea, all facets of military preparations were carefully analyzed, with air defense, particularly the vulnerability of the land-based radar, being of great concern.